MARKINGS AND INSIGNIA

Apart from the colours used for camouflage, numerous shades were introduced and used for other applications such as interiors, markings and insignia.

RLM No.	Designation	Purpose
RLM 02	RLM Grau	Interiors, camouflage
RLM 04	Gelb	Markings
RLM 21	Weiss	Markings, winter camouflage
RLM 22	Schwarz	Markings, night camouflage
RLM 23	Rot	Markings
RLM 24	Dunkelblau	Markings
RLM 25	Hellgrün	Markings
RLM 26	Braun	Markings
RLM 27	Gelb	Markings
RLM 28	Weinrot	Markings
RLM 66	Schwarzgrau	Interiors, camouflage
RLM 77	Hellgrau	Markings on night camouflage

Colours listed above were used for all kinds of markings, whether these were for lettering in the various colour shades, identification marks, instructions, call sign markings, theatre of war markings (for example, yellow for the East, white for the South), or the insignia of the various units and many other areas of use.

265 Above: *Members of the RAF recovery team study the kill markings on the tail fin of* Lt *Dolenga's Dornier Do 217E-1 (see photos 103, 221). The picture gives a perfect view of the standard style of swastika used throughout most of the war, here 420mm square (see page 152). Note the dotted red line on top of the fin indicating the position for the gust lock*

Regulations on the marking of aircraft

There were precise directives governing the execution of all markings on aircraft of the German Luftwaffe. To provide a general overview, these are reproduced in full here. The following section has been extracted from the Reich Law Gazette No. 78 of 29 August 1936:

"**National and Registration Markings, 1936**

The national marking carried by German aircraft and airships is the letter D, four additional letters comprise the registration marking. For airships the Reich Minister for Aviation may permit non-standard registration markings.

Aircraft carry the national marking D and the registration marking on both sides of the fuselage between wing and tail unit, monoplanes additionally on both surfaces of the wings, biplanes on the undersides of the lower wings and the top surfaces of the upper wings.

Airships carry the markings at the point of their largest circumference on both sides of the envelope, so that they are visible from the sides and from the ground, and also on the top of the envelope at the same distance from, and at right angles to, the side markings.

"The markings are to be indelibly applied either in dark square capitals on a light background, or light square capitals on a dark background, and are to be maintained in a clearly visible condition. The national marking D is to be separated from the registration marking by a hyphen with a length of one character width. The characters should occupy a rectangular field and be as large as possible without being obscured by components such as e.g. engine nacelles, struts, wheels or floats.

In the case of aircraft the shortest distance between the lettering field on the wings and the wing edges should, at its narrowest point, be no less than a sixth of the character height; with airships the height of the characters on the envelope should be a twelfth of the circumference at its largest cross-section, but should not exceed 2.5 m.

Towed aircraft, which have been registered and licensed, carry the national marking D and the registration marking in the same way as powered aircraft,

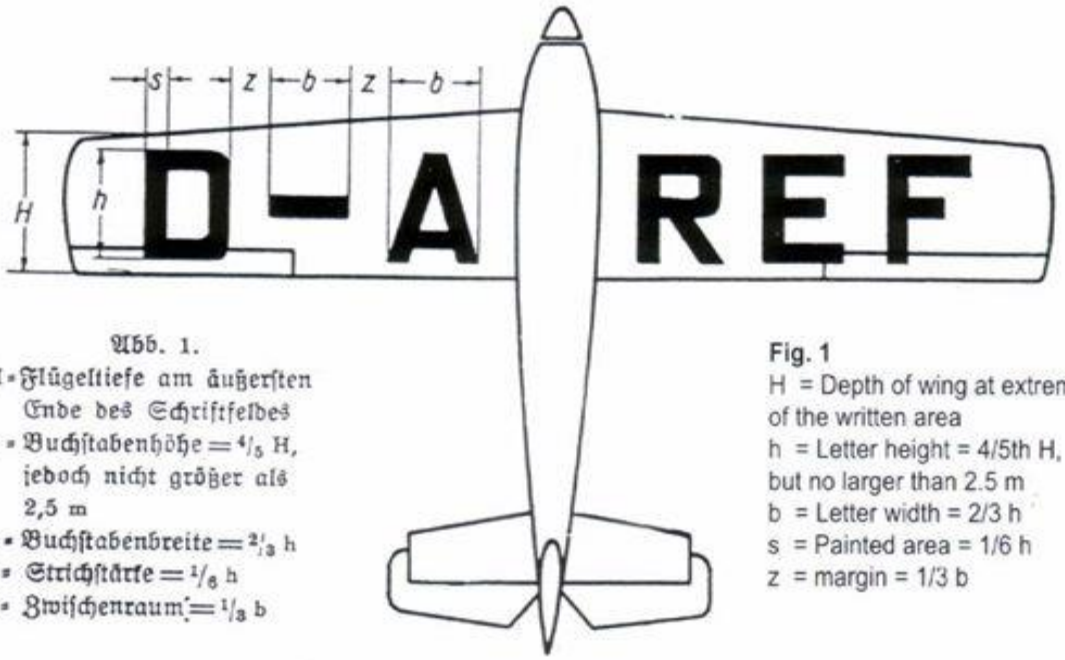


Abb. 1.
H = Flügeltiefe am äußersten Ende des Schriftfeldes
h = Buchstabenhöhe = 4/5 H, jedoch nicht größer als 2,5 m
b = Buchstabenbreite = 2/3 h
s = Strichstärke = 1/6 h
z = Zwischenraum = 1/3 b

Fig. 1
H = Depth of wing at extreme end of the written area
h = Letter height = 4/5th H, but no larger than 2.5 m
b = Letter width = 2/3 h
s = Painted area = 1/6 h
z = margin = 1/3 b

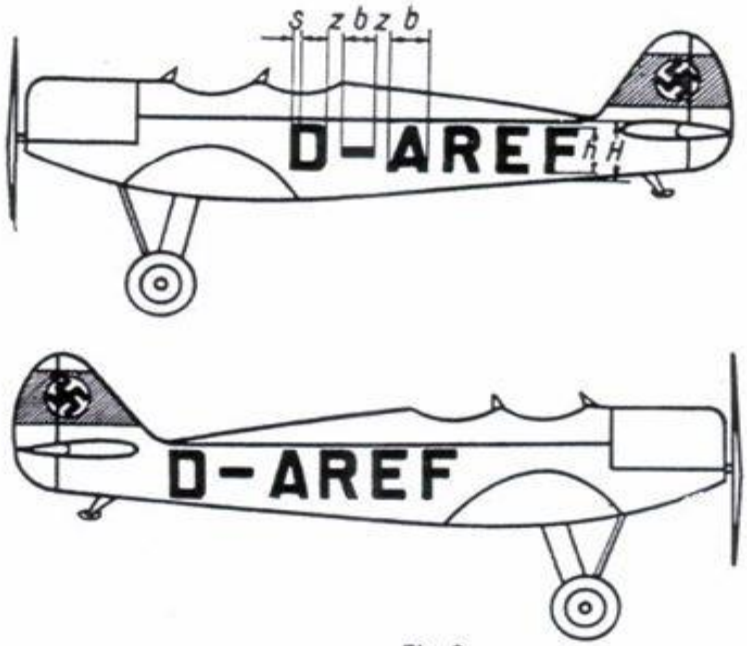


Fig. 2
H = Fuselage height at tailplane (rear end of the written area)

266 Below left, 267 Right: *These extracts from the* Flugzeugmaler *(The Aircraft Painter) for 1939 shows how the national markings, the Balkenkreuze and the identification markings on military and civil aircraft were to be applied in the pre-war period*

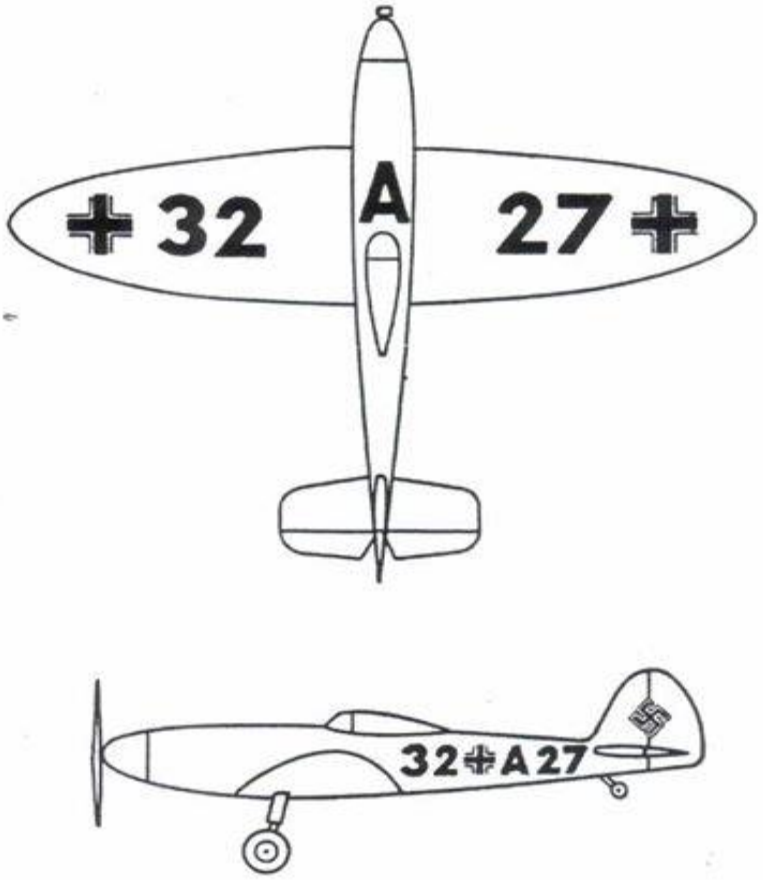


Fig. 3 Markings of military aircraft

"but these markings should be underlined with a continuous line.

Gliders flown outside recognized glider areas carry the national marking D similar to the above mentioned powered aircraft markings.

Free-flying balloons carry the national marking D and their name in accordance with the regulations for markings on airships.

Reich and National Flag

Aircraft and towed aircraft carry the Reich and national insignia in colour on both port and starboard sides of the vertical tail surfaces. The colour marking must be of equal size on both sides and its dimensions must be such that it occupies at least half the height of the vertical tail surfaces above the tailplane and provides a ratio of approx. 3:5 in flag height to length on each side.

The colour application is to be arranged as follows: Inside the red stripe is a white disc containing a black swastika, whose arms are canted at 45 degrees. Red stripe, white disc and swastika have a common centre point. The angle of the swastika nearest to the leading edge of the tailfin is open to the top. Diameter of the white disc equals three-quarters of the height of the red stripe. Length of the main bars of the swastika equals half the height of the red stripe. Width of the main bars and angled arms of the swastika, and their distance from each other, equals a tenth of the height of the red stripe.

Airships carry the Reich and national insignia in colour on both port and starboard sides of the vertical control surfaces. The size of the flag and the dimensions of the colour area are decided in each individual case by the Reich Minister for Aviation!

Gliders carry the Reich and national insignia as described above for powered aircraft.

Free-flying balloons fly a swastika flag.

Aircraft which, for reasons of design or otherwise, make the application in the prescribed form impractical, are issued with suitably amended markings as directed by the Reich Minister for Aviation.

268: *The Reich insignia as it was to be applied in the pre-war period*

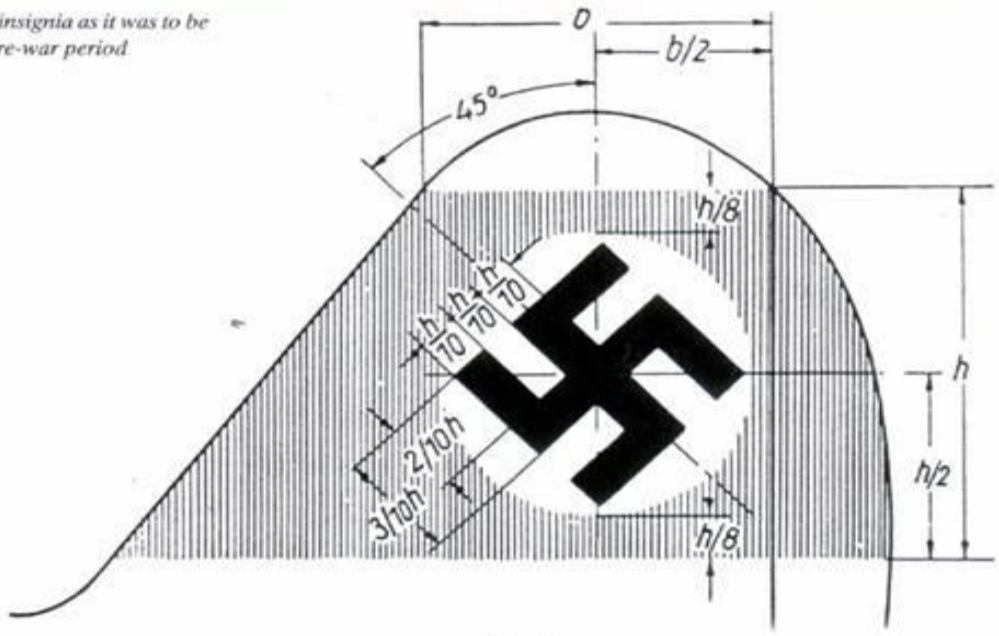


Fig. 4

"**Other Markings**

On the fuselage, wings and wing components of aircraft, the name and address of the manufacturer, type, serial number and year of manufacture of the component concerned should be displayed, clearly visible, preferably on a fixed plate. In addition, on the left side of the fuselage the following should be specified on a light background in dark letters at least 25 mm high and 4 mm thick:

a) Name and address of the owner
b) Tare weight, load and max. permissible all-up weight
c) Max. permissible number of people, including crew
d) Dates of last inspection and next check

Similar information should be displayed at a clearly visible location inside the gondolas of airships.

In the cargo hold a loading plan in diagram form should be displayed in a clearly visible location.

On engines a metal plate, giving the following information, should be affixed in a clearly visible location:

a) Name and address of the manufacturer
b) Type, model, serial number and year of manufacture
c) Full-load and max. permissible RPM

For the display of advertisements the following deviations are permissible:

On biplanes the markings should be executed as follows:

National Marking D & Registration Marking	**Advertisement**
Upper surface of top wing (prescribed size)	Underside of the lower wing
Underside of the upper wing (prescribed size)	
Underside of fuselage (prescribed size)	
Rear third of fuselage sides (as large as possible)	The front third of fuselage sides

On monoplanes correspondingly:

National Marking D & Registration Marking	**Advertisement**
Upper surface of wing (prescribed size)	Underside of wing
Underside of fuselage (prescribed size)	
Rear third of fuselage sides (as large as possible)	
Underside of stabilizer or elevator (as large as possible)	The front third of fuselage sides

Where several aircraft display the same marking, a clearly differentiating sign should, if possible, be provided e.g. by way of a number (Trumpf I, II...). Aircraft employed in commercial airline service are not permitted to carry advertisements! The use of aircraft bearing advertisements must be restricted to domestic flights. Requests for exceptions must be submitted via the Air Office to the Reich Minister for Aviation.

Aircraft and airships engaged on test flights with blind flying equipment or autopilot devices carry two pale yellow bands around the fuselage as an identification marking. Apart from the red stripe of the national insignia, the use of red paint on aircraft and airships is not permissible!

Aircraft Position Lights and their Special Identification on Water

The following regulations apply under all weather conditions between sunset and sunrise. During this period no other lights may be shown, which could be confused with those described below.

The term "visible" means; visible on a dark night in clear air.

The visual angles dealt with below, and the terms "right", "left" and "rear", refer to an aircraft in a normal position, in horizontal forward flight, or at rest on the ground or water.

In the air, or while at an airport, aircraft must display the following position lights:

a) on the right (starboard) side a green light arranged in such a way that it throws an uninterrupted beam over a horizontally measured angle of 115°; this being bordered by two vertical planes in the direction of flight, of which the left one is parallel to the longitudinal axis of the aircraft. It must have sufficient light intensity in the direction of flight for the beam to be visible for approx. 8 km. Within the specified dihedral angle the light intensity in all directions may not fall below the following values (*refer to diagram below*):

Overlapping of the light angle in direction of flight is permissible, if within the 0° to 10° angle to the direction of flight the light intensity reduces from 100% to 0%.

b) On the left side is fitted a red light which — as per the arrangement described above — also illuminates an angle of 115°, whose right vertical plane is parallel to the longitudinal axis.

c) At the rear, as far aft as possible, is a white tail light with an uninterrupted beam illuminating a hemispherical area whose base plane is vertical to the longitudinal axis of the aircraft. It must be visible within this hemisphere for 4 km.

Aircraft moored on water must display the following position lights:

a) An aircraft which can move under its own power on water (manoeuvrable aircraft) has to set the position lights described above. In addition it must carry a white light on the bow which throws an uninterrupted light angle of 225°. Its median line must correspond to the aircraft's longitudinal axis. The light intensity must be sufficient for it to be visible for 8 km on a dark night. This light intensity must be provided over an angle from 5° below to 20° above the horizontal plane of the aircraft when afloat.

b) A towed aircraft has to carry the normal position lights without the bow light.

c) An aircraft which is no longer manoeuvrable has to display two red lights positioned vertically one above the other, distanced at least 1 m apart, and so positioned that they can be best seen from all directions.

The position lights of non-manoeuvrable or anchored aircraft must be visible for at least 2 km.

Airships must also comply with the above regulations regarding the lighting arrangement for powered aircraft.

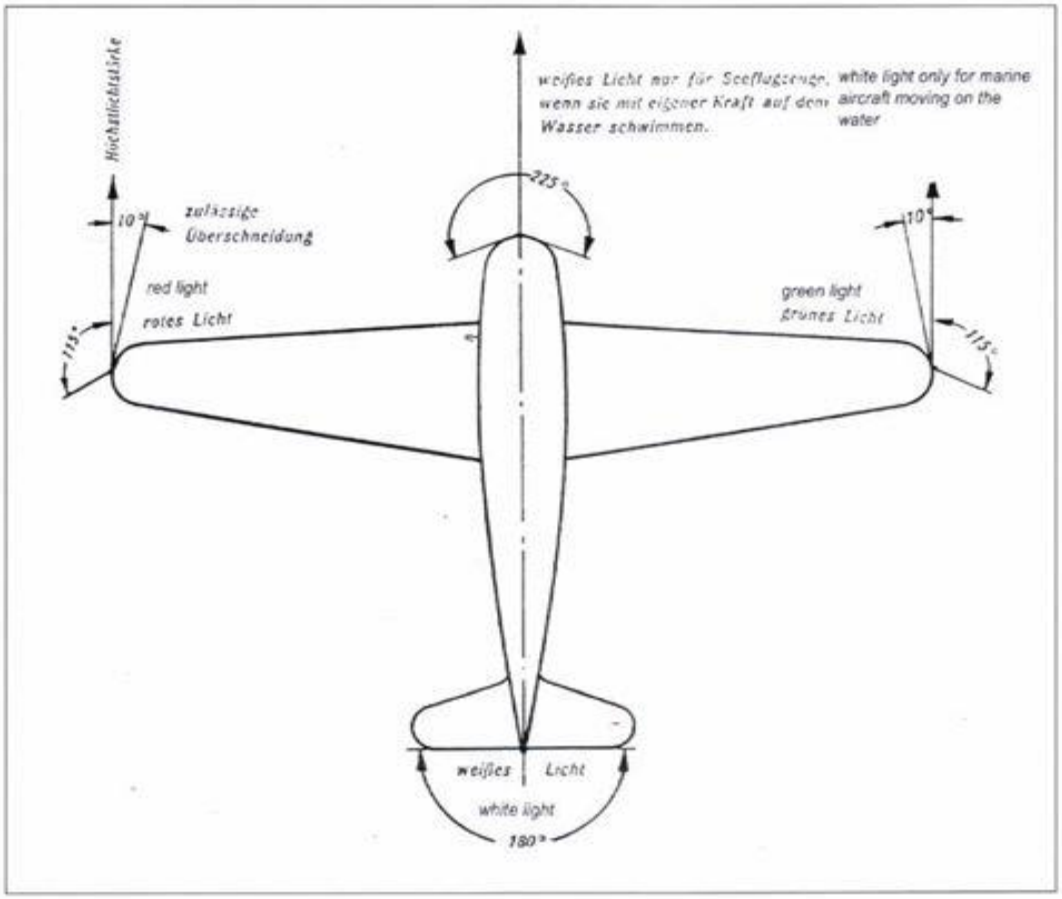
Gliders have to make their presence known by means of light signals when other aircraft are approaching.

During night flights free-flying balloons must carry electric spotlights with an incandescent bulb of at least 20 Watts and a radiation angle of at least 30°.

If another aircraft comes into the vicinity of the balloon, the balloonist has to flash signals, of 1 second duration followed by a 1 second pause, alternately illuminating the balloon envelope and then in the direction of the oncoming aircraft.

In the case of aircraft, whose design makes attachment in the prescribed form either impossible or extremely difficult, the Reich Minister for Aviation determines the type of provision to be made.

Angle to direction of flight	0¡	10¡	20¡	30¡	40¡	60¡	80¡	115¡
Light intensity in % of the light intensity in direction of flight	100%	94%	78%	59%	40%	21%	15%	19%



269 Left: *Diagram showing the layout and functioning of aircraft position lights with particular reference to marine aircraft on the water*

270 Right: *The official diagram accompanying the instruction changing the style of the swastika dating from 1 January 1939*

271 Lower right: *The standard style for numerals and letters to be carried by all German aircraft*

Changes to aircraft markings 1939

Luftwaffe Regulation Notice No. 5 of 30 January 1939 ordered the following change to the Luftwaffe's national markings:

"With effect from 1.1.1939, the following amendment applies to the marking of Luftwaffe aircraft (military aircraft):

1. Instead of the Reich and national flag, all aircraft of the Luftwaffe will bear the swastika as per annex.

2. The military identification markings at present applying (Balkenkreuz and numbering) remain unchanged.

3. Aircraft belonging to squadrons, training schools and other Luftwaffe units not bearing military markings (see Fig. 2) will receive the letters 'WL' instead of the 'D', the letter series otherwise remaining unchanged."

The Luftwaffe Regulation Notice goes on to say:

"1. The swastika retains its existing dimensions.

2. The swastika receives a white margin amounting to one-sixth of the breadth of the bar.

3. The white edging is limited on the outside by a black line, of a width of one quarter of the white edging.

4. All other parts of the existing national markings on a red base will be sprayed with camouflage shade 70 for 2 tone camouflage and camouflage shade 61 for 3 tone camouflage.

5. When this is done, the swastika, including the edging referred to in items 2 and 3 will be protected with masking tape. The uncovered parts of the original national marking will be roughed up with careful wet rubbing down.

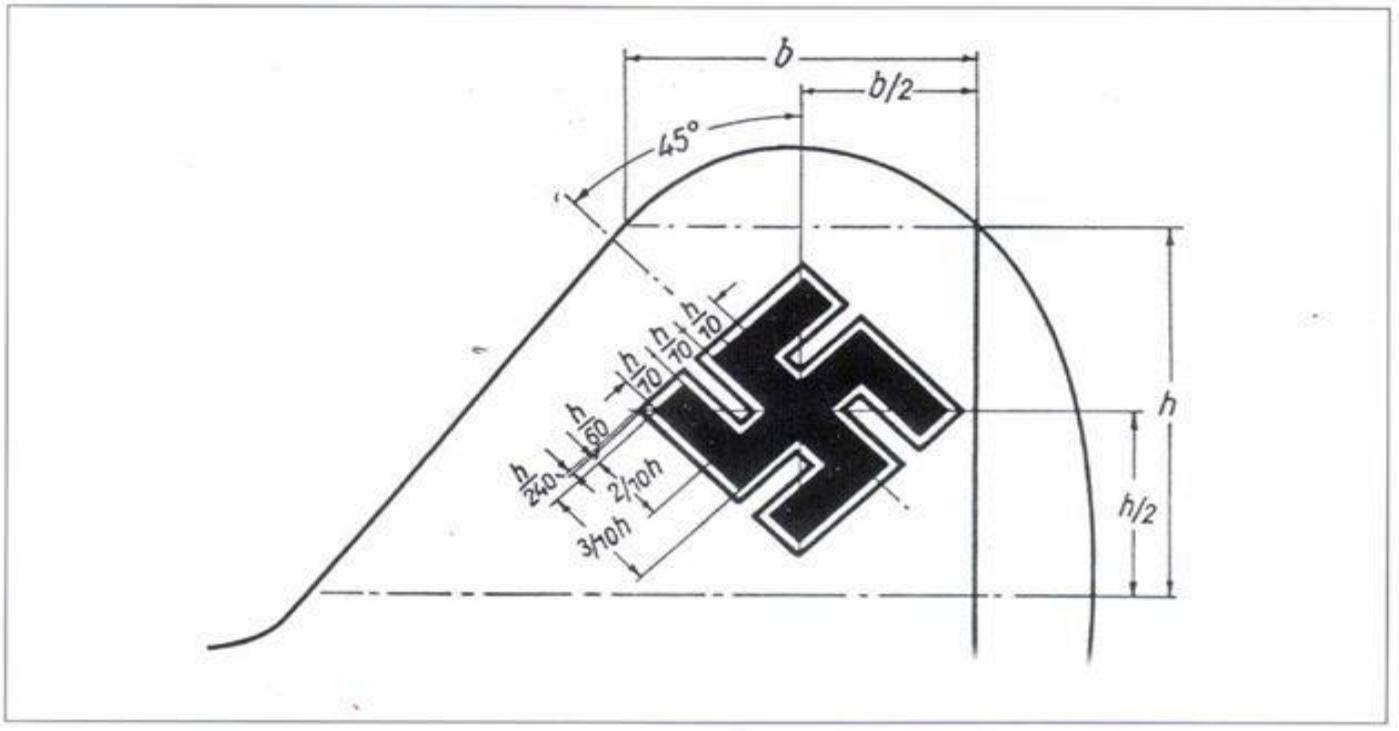
6. When fully dry, parts so treated will be sprayed with shade 70 or 61.

7. Finally, the black edging line (3) will be outlined in shade 22."

Markings 1943

The *Flugzeugmaler* (The Aircraft Painter) for 1944 contains the following passage: (*Note that this is repeatedly broken up with explanatory drawings, as in the original*)

"**1. Registration and Staffel Designations**
Markings on aircraft are executed in block form, irrespective of whether they are numbers or letters. Par-



ticular care has to be taken to ensure that the bars are of equal thickness. In lettering a distinction is made between letter height, width of the letters, thickness of the lines and the distance between letters. The spaces must be arranged so that they appear of equal width. Irregular spacing results in a distorted lettering image.

The letters C, E, F, J and L are drawn slimmer; otherwise they would appear to be too wide. Both M and W are appreciably wider.

Lettering dimensions:
Height of letter = $^{6}/_{10}$ the size of the Balkenkreuz
Width of letter = $^{4}/_{10}$ the size of the Balkenkreuz
Thickness of letter = $^{1}/_{10}$ the size of the Balkenkreuz
Spacing = $^{2}/_{10}$ the size of the Balkenkreuz

The centre line of the height of the letters is the centre line of the Balkenkreuz. It runs parallel to the horizontal line of flight, not to the fuselage centre. On wing upper and lower surfaces the centre line is at right angles to the direction of flight.

Fig 48. Block lettering for aircraft

2. Markings of Civil Aircraft
Example: D-ATUM

D = National marking of Germany
A = Code letter for the weight class to which the aircraft belongs. Also indicates number of people and pilot's licence classification.
ATUM = Registration marking, important for the air police.

The national marking is separated by a hyphen from the registration code. On German aircraft the registration code must always consist of four letters.

3. Swastika on Vertical Tail Surface
All Luftwaffe aircraft carry the swastika as the national marking. It is positioned on the tail fin, in the case of twin tail units always on the two outer surfaces.

272

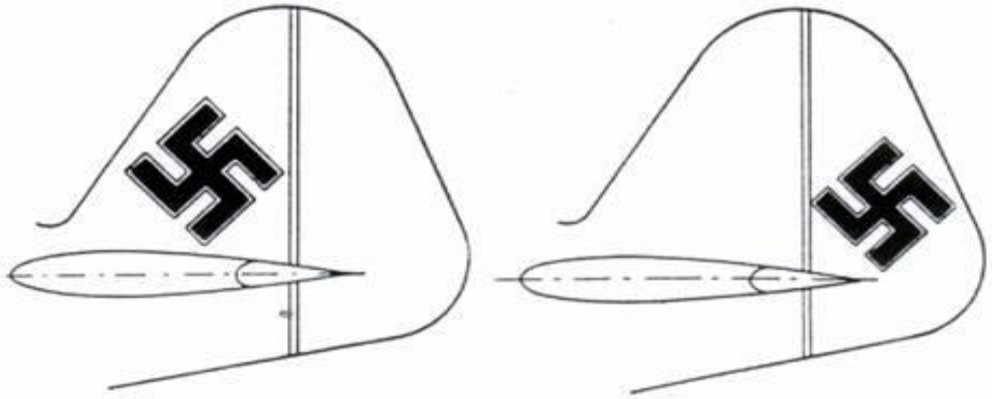
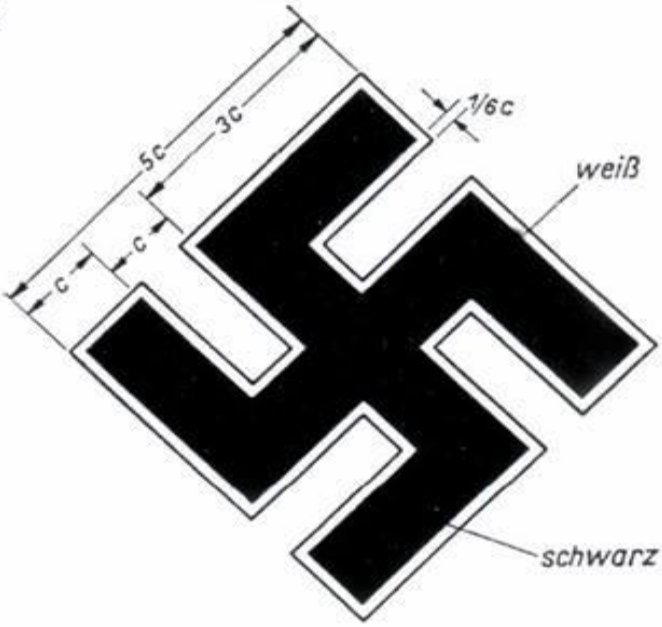


Fig. 49 Swastika on vertical tail surface

"The Swastika is marked out with a white and black contour (size as on the drawing below).
The lower limb of the swastika lies at a diagonal angle of 45°. The limb closest to the leading edge of the tail-fin is open upwards.
The size of the whole cross is at least one quarter of that of the tail-fin above the elevator. The swastika will be developed from a square of 25 equal squares. 1/5 of the side of the square produces the thickness of the cross.
1/6 of the thickness of the cross is the white contour and 1/4 of the white contour is the external black edging. Both contours lie outside the swastika."

273



Size Dimensions

Abmessungen

Größe 5c	315	(400)	500	(630)	800	
c	63	80	100	126	160	
3c	189	240	300	378	480	
1/6c	10	13	17	21	27	

Auf Sichtschutzanstrich Farbton 70÷75 fällt schwarzes Innenteil des Hakenkreuzes fort.

The black inner part of the swastika is omitted with camouflage paint 70 + 75

Fig. 50 Size ratios of the swastika

The Balkenkreuz* on the fuselage and wings
On military aircraft:
1. On the upper side of the flying surface, from the tip to the centre of the cross a distance of 2m. Largest dimension 1m.

2. On the underside of the flying surfaces, for biplanes on the underside of the bottom flying surfaces at the centre between fuselage and wing tip. With multi-engined aircraft, at the centre of the external engine to the wing tip. Maximum size 2 m.

3. The Balkenkreuz on the fuselage extends to its full height. For an aircraft with curved fuselage, the height of the Balkenkreuz is 1/4 of the circumference of the fuselage in each case, maximum 2m."

**Literally 'Bar' or 'Beam' Cross*

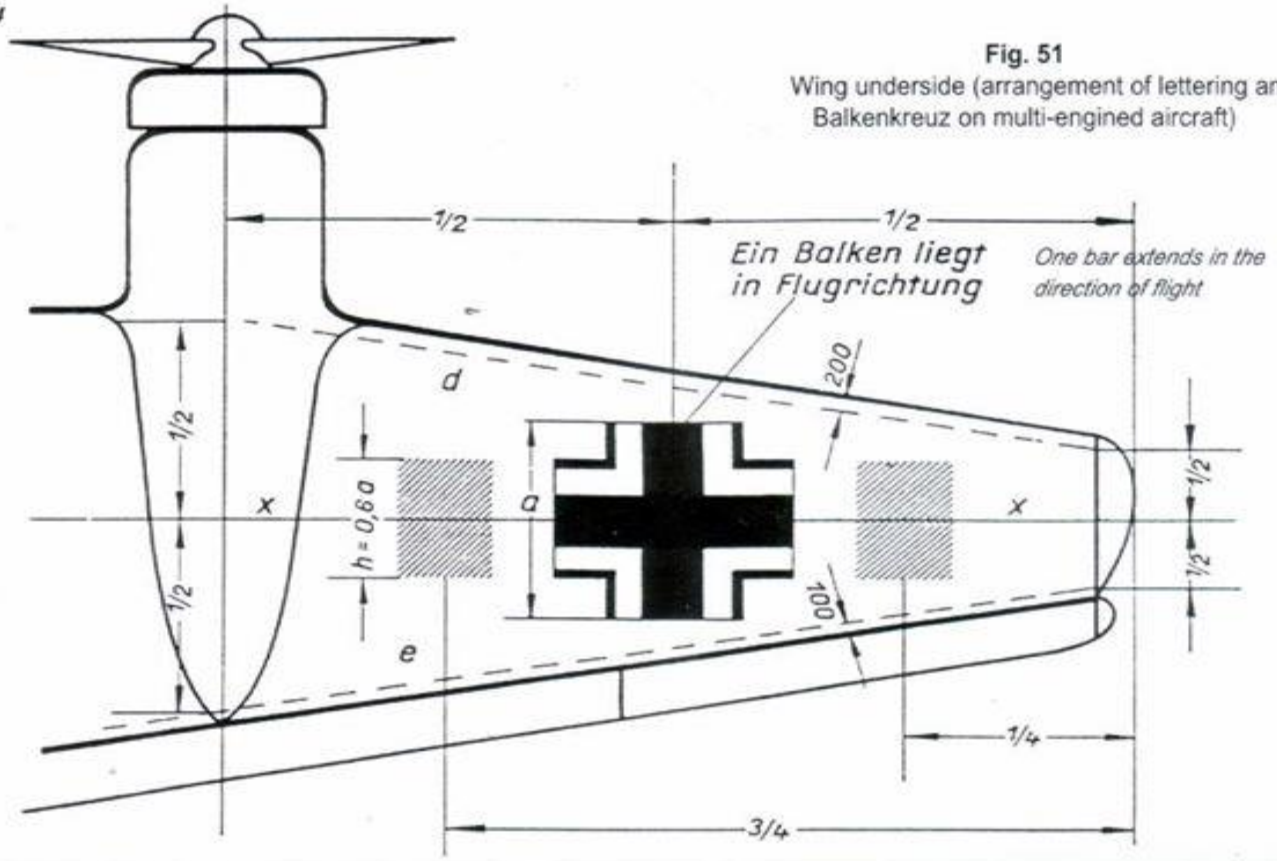


Fig. 51
Wing underside (arrangement of lettering and Balkenkreuz on multi-engined aircraft)

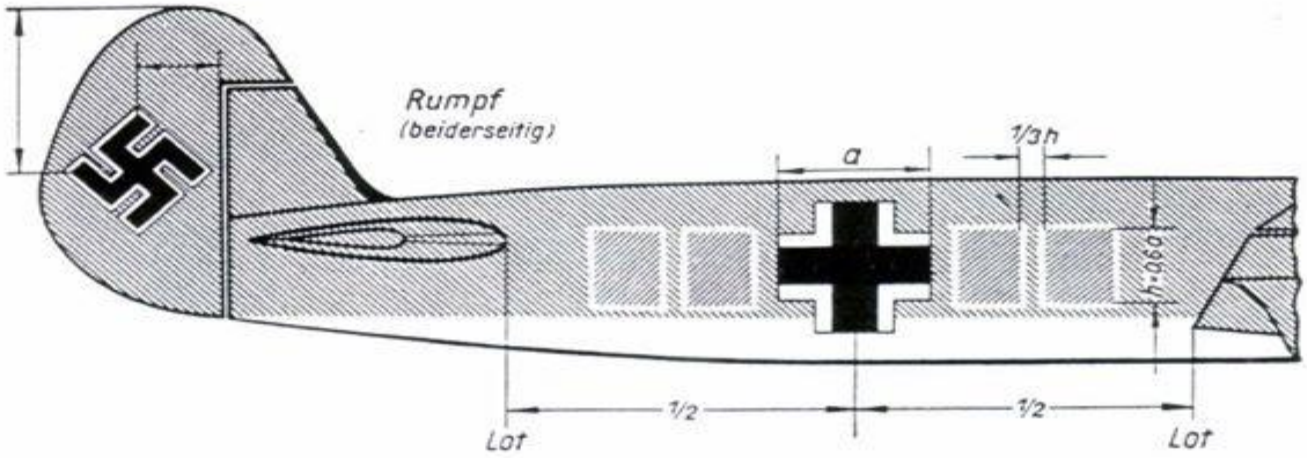


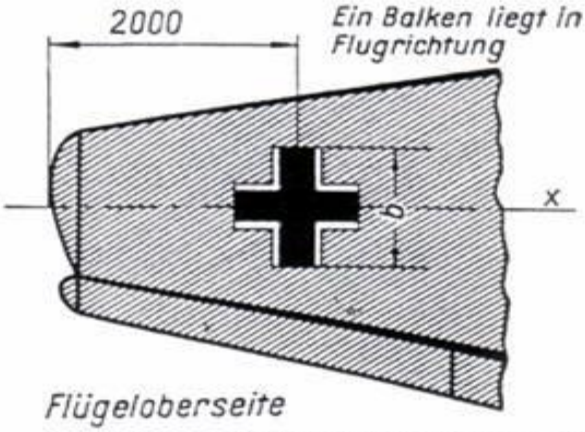
Fig. 52 Both sides of fuselage on military and frontline aircraft

"**For frontline aircraft:**

1. On the upper side of the wing, for biplanes on the upper side of the upper flying surface as described under 1.

2. The Balkenkreuz beneath the wings lies at the centre between fuselage and wing tip.

3. On aircraft used at the front, the Balkenkreuz on the fuselage is as already described in item 3. It is placed at the centre of the fuselage on both sides between the end frame of the wing and the foremost edge of the tail-fin.



One bar in the direction of flight

Flügeloberseite

Der Mittelpunkt des Balkenkreuzes auf Flügeloberseite liegt auf der festgelegten Mittellinie X 2000mm vom Flügelende entfernt.

Wing uppersurface
The centre point of the Balkenkreuz on the uppersurface of the wing lies on the ascertained centre line x 2000 mm from the wing tip

Fig. 53 Wing surface for frontline aircraft

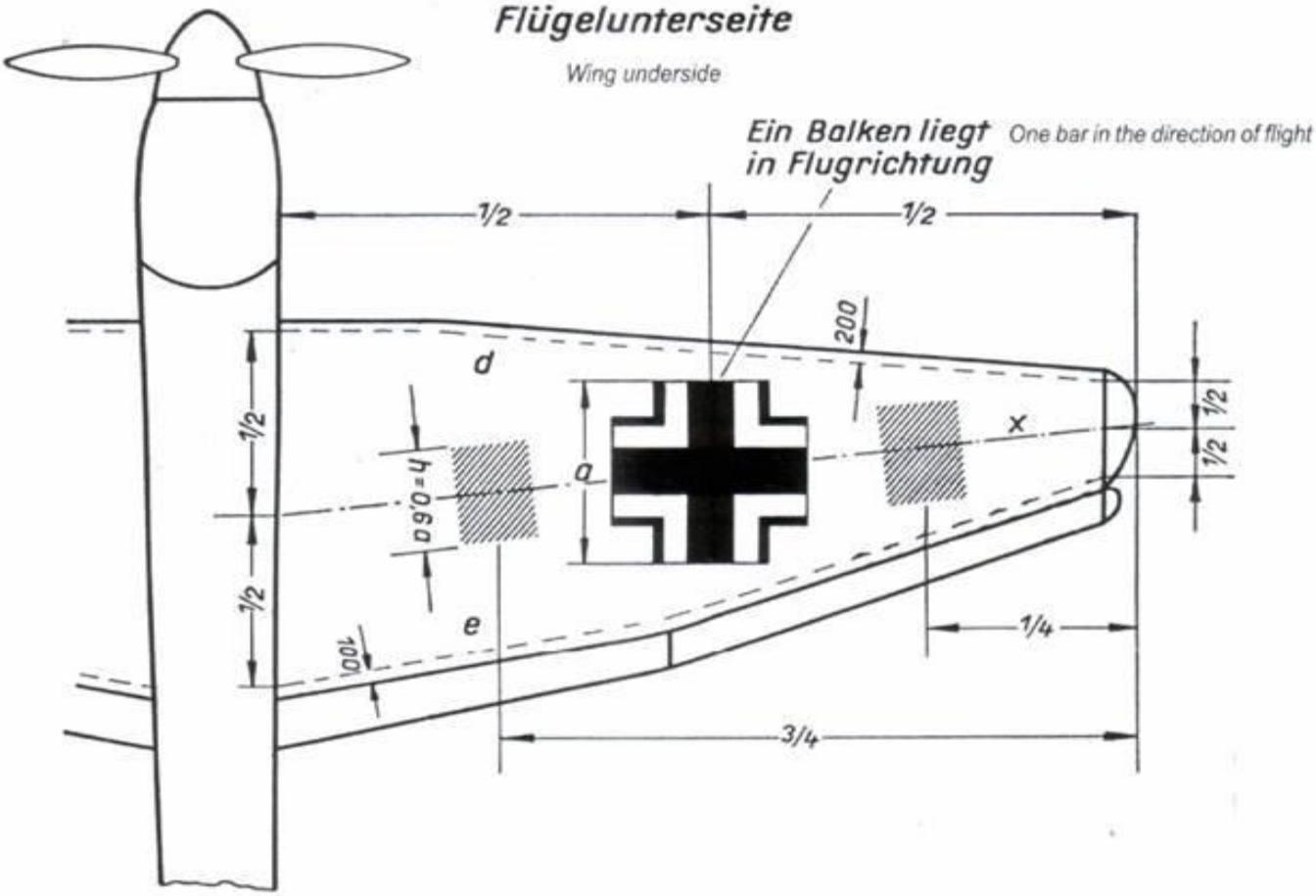


Fig. 54 Underside of wing
(Arrangement of lettering and Balkenkreuz for single-engined aircraft)

"General for all military aircraft:

1. One bar of the cross is always in the direction of flight on and beneath the wings and also on the fuselage. The cross is coloured black and accompanied with a strong white line.

2. The dimensions of the Balkenkreuz on the fuselage and beneath the wings are as follows:
1/4 of the length = thickness of the black cross
1/8 of the length = thickness of the white line
1/32 of the length = thickness of the black contour

3. The white stripe on Balkenkreuz on the wings is narrower. The dimensions are as follows:
1/4 of the length = thickness of the black cross
1/20 of the length = thickness of the white stripe
1/32 of the length = thickness of the black contour

In order to save labour, new aircraft and the like whose paintwork is renovated in a repair shop will receive simplified national markings on the wing surfaces, fuselage and tail.

The Balkenkreuz on the underside of the wing remain unchanged in all circumstances!

The national markings applied to the dark camouflage tones (shades 70 and 71 for land-based aircraft, 72 and 73 for naval aircraft, and 74 and 75 for fighters) will be simplified, the following being omitted:

4a. The black outer border of the Balkenkreuz

4b. The black centre of the national marking; if the fuselage Balkenkreuz is positioned partly on the light camouflage shade 65 or 76, the dark shade (70 to 75) should be extended within the white angles where these are located on the light shade.

4c. The black border of the swastika on the vertical tail surface, irrespective of the colour of the background (see TAGL Codes: 1 P 10 g, No. 37/42).

4d. Wing markings, such as letters and numbers, are deleted from operational and front-line aircraft. On the underside of the wings of front-line aircraft the third letter is positioned midway between Balkenkreuz and wingtip. On military aircraft all four code characters are to be carried on the underside of the wings.

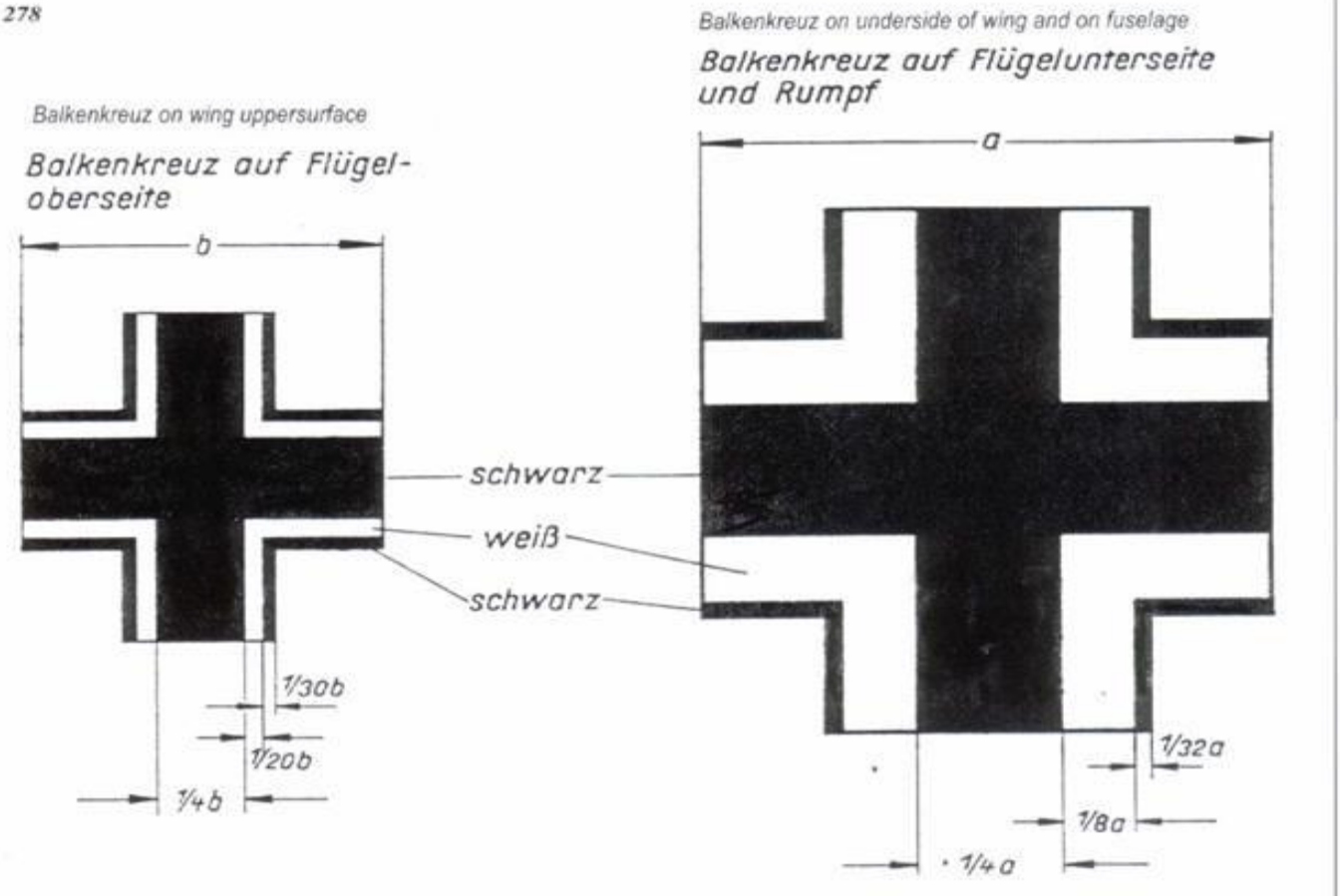


Fig. 55 Dimensions of the Balkenkreuz

As indicated above, there were two variants of Hakenkreuz (literally 'hooked cross'—swastika) and Balkenkreuz. A further simplification was introduced in *Sammelmitteilung* 2 of 15 August 1944.

"**National markings**

It is evident that despite various orders concerning simplifications, savings, etc. the cross and swastika are still being applied in their original form. For the Balkenkreuz only the angle and for swastikas either the black part or only the white edging need be painted. On the bright shades 76 and 21 only the black angles of the Balkenkreuz and black swastika, and on the dark shades 72,73, 75, 81, 82 and 83, only the white angles of the Balkenkreuz and the white edging of the swastika.

This regulation also applies to the use of stencils or transfers, where stocks will of course be used up. Future orders will however, be made as above. Shade 77 grey will be substituted for shade 21 for the angles and edging on night camouflage in shade 22 (see L.Dv 521/1 p. 18).

Economy officers' attention will be drawn to this notice."

The above excerpt from the *Sammelmitteilung* is particularly interesting because it shows the change in the general marking of the Luftwaffe's aircraft, from the very laboriously produced white stripes executed with black edges to no more than rudimentary markings by the last months of the war.

DIMENSIONS OF NATIONAL INSIGNIA

These sizes, in mm, are extracted from various Aircraft Handbooks and factory drawings. The list of types is not exhaustive, nor does it show all variations for a type. Reference should be made to photographs for these. Dimensions with a question mark are estimated as they are not specified on the original drawings. Later sizes are shown after the /

Type	Above wing	Below wing	Fuselage	Swastika
Do 217E	1000	1750	1250	420
Fw 190	910	900/910	800/810	540/530/480
He 111	1000	2000	1800/1400	710/650
He 177	1000/900	1900	1600/1500	1086/900
He 219	630	1000	1000	420?
Hs 129	1000	1200	1000	420
Ju 88	1000	1400?	1000?	650
Bf 108	900	800/750	800	300
Bf 109G	1000	950	950	315
Bf 110	1000	1200	1000	500
Me 262	630	800	800	430

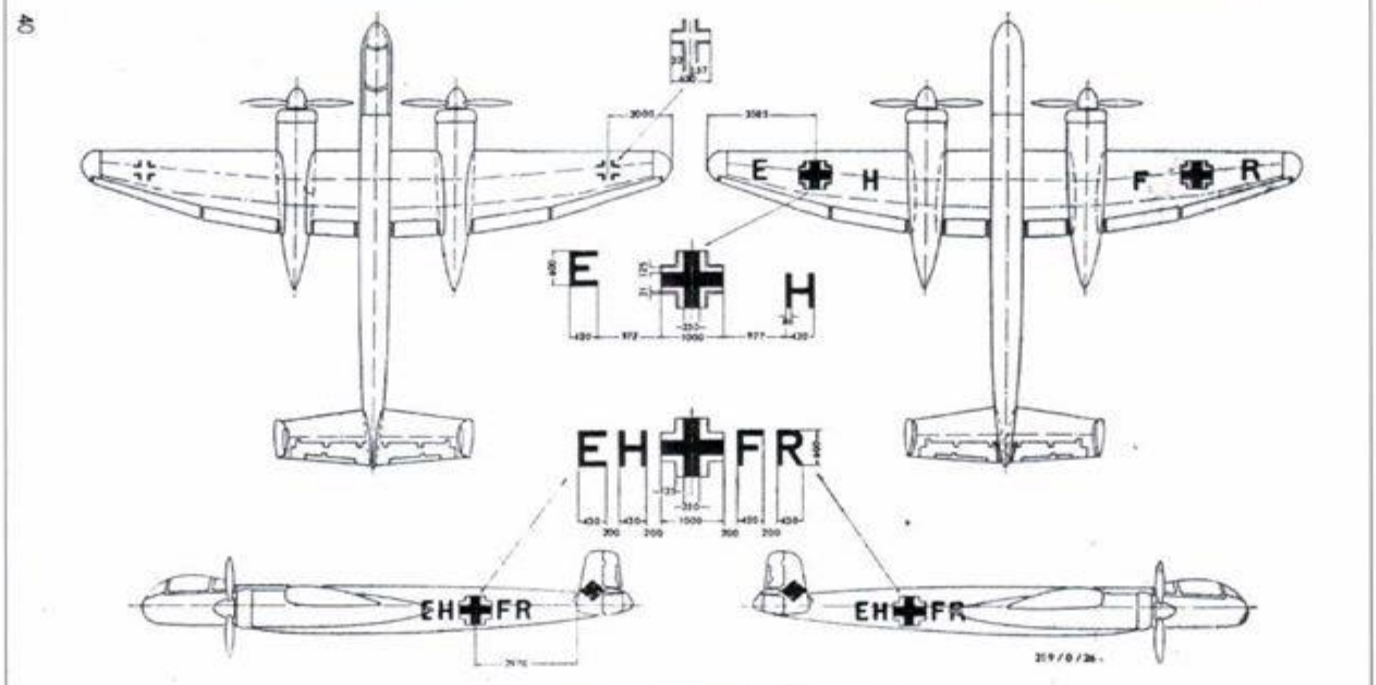


Abb. 18: Beschriftung des Flugzeuges

Other Markings

"Marking of completely or partially overhauled engines:

a) With each partial overhaul (whether in Luftwaffe workshops or by the industry) every engine has to be marked with a yellow triangle (length of sides 15mm) as follows:
With in-line engines on the left side of the crankcase
With radial engines on the gearbox or front of housing.
Above this mark the engine serial number is to be applied (height of characters 40mm).
The number of triangles painted next to each other indicates the number of partial overhauls carried out.

b) After the first complete overhaul the yellow triangles are oversprayed and a red triangle (length of sides 15mm) is painted in their place. With every subsequent partial overhaul another yellow triangle is to be added. With every subsequent complete overhaul the yellow triangles are again deleted and replaced by a further red triangle. This results in showing
-the number of complete overhauls and
-the number of partial overhauls.

Visual levelling points

Marking of aircraft. Markings provided by the factory (e.g. red-painted rivet-heads) may under no circumstances be oversprayed by another paint and thus rendered unidentifiable. The aircraft painter requires these markings for the positioning of lettering.

Other markings

Surfaces which may be walked on have to be differentiated from those which may not be walked on by a 10mm wide broken line (length of dashes = 20 mm, spacing = 20 mm). Within these areas the following warning should be stencilled in bold, medium spaced letters: "Walk here only!" Delicate components such as trim tabs are to be marked: "Do not touch!"

Snap locks are generally marked by a red line in the direction of flight. The red line is positioned so that it protrudes 1cm to the right and left of the snap lock.

Special marking during the war

For the duration of the war all military aircraft display special markings in order to make identification of the flying units and their strengths more difficult for the enemy.
While in peacetime every airman is familiar with aircraft markings in their proper sequence, e.g. Luftkreis, Geschwader, Gruppe and Staffel numbers, in wartime these are disguised by being replaced with letters, i.e. they are secret.
Yellow wing tips, a yellow or white band around the fuselage are part of this. Decorations during the war include e.g. the number of aircraft shot down or ships sunk, which are painted on the vertical tail surface and which are familiar to everyone."

Markings of aircraft of light fighter units, 1938

On 14 December 1937 the following directive, Ref. No. FL.In 3 No. 730/37 II, was issued by the Generalstab of the Luftwaffe:

"Markings of Aircraft of Light Fighter Units:
The following markings come into force with immediate effect and render null and void all previous directives concerning the marking of light fighters.

Application of Markings:
National insignia (Balkenkreuz and swastika) as before.
The markings are applied only to the two fuselage sides. In order to ensure uniformity of appearance of the aircraft, the dimensions and locations as specified are to be strictly adhered to.

Organization and Structure of Aircraft within the Staffel

Markings of Staffel aircraft:
a) Staffel aircraft (including reserve machines) display the Arabic numerals 1 to 12, as follows:
1., 4., and 7. Staffel in white without border,
2., 5. and 8. Staffel in red with white border,
3., 6. and 9. Staffel in clay-yellow with black border.

(Author's note: White = RML 21, Red = RLM 23, Clay-yellow = RLM 04)

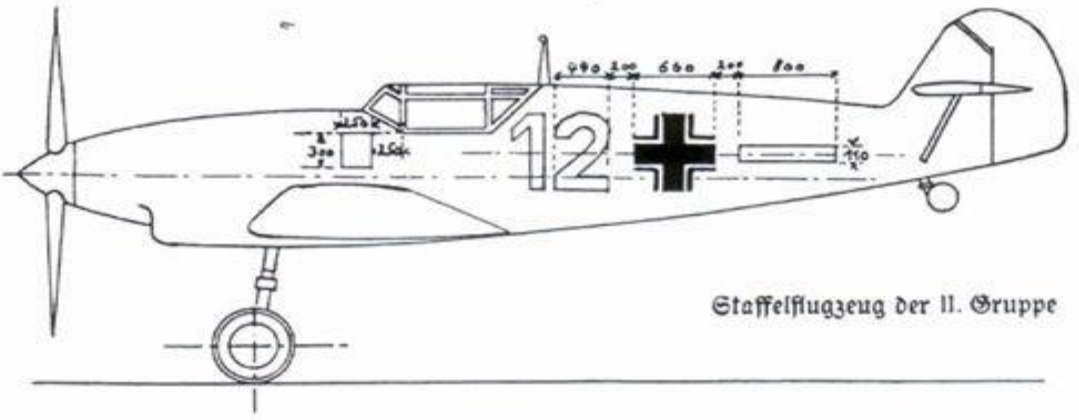
b) Markings of Gruppe and Gruppenstab
I. Gruppe of the Geschwader displays no Gruppe marking.
II. Gruppe displays a horizontal bar aft of the Balkenkreuz in the appropriate Staffel colour and border.
III. Gruppe displays a vertical bar also in the Staffel colour and border. Instead of a number, the aircraft of the Gruppenstab leader carries a chevron and triangle in black with white border. The Gruppe marking (I. no marking, II. horizontal bar, III vertical bar) is also in black with white border.
The two wingmen of the Gruppenstab are marked similarly to the leader's aircraft, but display only a chevron without the triangle.

c) Identification of the Geschwader and the three aircraft of the Geschwaderstab."
A 250 x 300 mm area (see sketch) is provided for the Geschwader badge. In this field a special Geschwader emblem is to be applied. The Geschwaderkommodore and Gruppenkommandeure are to forward suggestions by 1.2.1938. The emblems may only be affixed after permission is granted by R.d.L. (Reich Minister for Luftwaffe) and Ob.d.L. (C-in-C of the Luftwaffe). The 250 x 300 mm dimensions specified above have to be strictly observed.

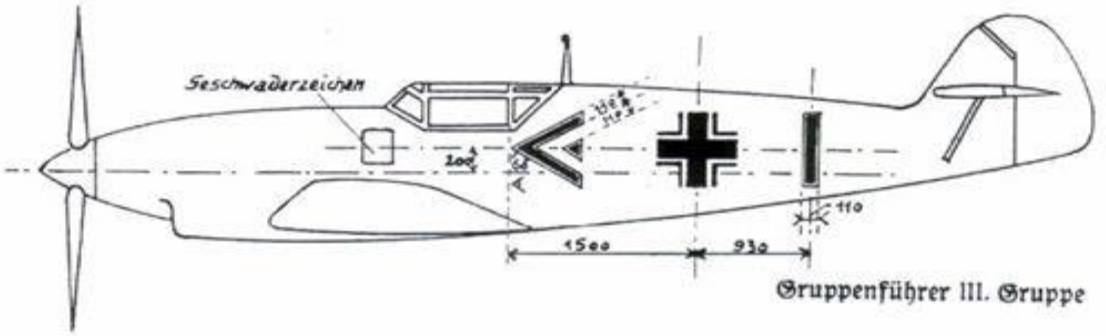
"The Geschwader leader's aircraft carries an arrowhead with horizontal bars extending back to the root of the tailfin. Colour black with white border.
The two wingmen display only the horizontal pointed bar without arrowhead. Colour black with white border.
The application of these unit markings relates only to Bf 109 aircraft models. It is unnecessary to change the markings on the He 51 and Arado 68, as these will be phased out with the delivery of the Bf 109.

A new directive for heavy fighters will be issued at the appropriate time."

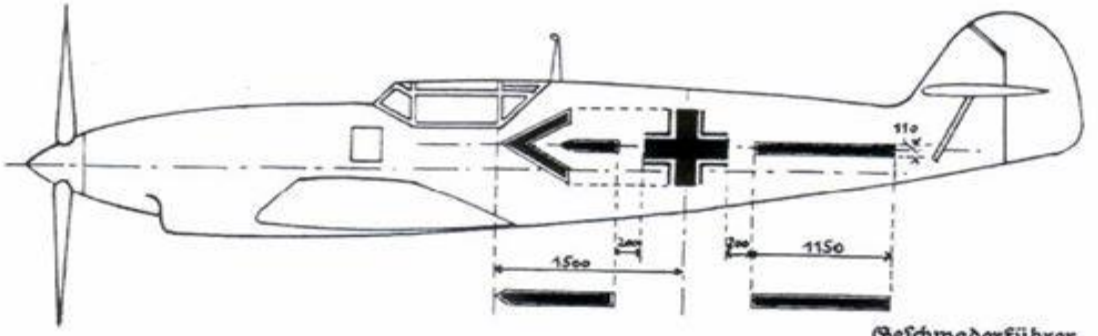
Bf 109 Markings



Staffelflugzeug der II. Gruppe



Gruppenführer III. Gruppe



Geschwaderführer

Kennzeichnung BF 109

Dimensions of Numbers:

Maße für Zahlen:

Höhe = 650 mm Breite = 440 mm Stärke = 110 mm

Height = 650 mm Width = 440 mm Thickness = 110 mm

Bei Zahlen und Zeichen mit Umrandung tritt ein Rand von 20 mm hinzu. Jedoch darf sich dadurch das Außenmaß nicht ändern. — Bei zweistelligen Zahlen ist der Abstand von Zahl zu Zahl 80 mm. Die Breite der 1 ist 260 mm.

For numbers and characters with outside borders a 20 mm border is added. However, this may not alter the overall dimensions.

With two-digit numbers the distance between numerals is 80 mm. The width of the 1 is 260 mm.

Ground-attack & fast bomber unit markings, 1943

"**I. Application of markings.**

National insignia (Balkenkreuz and swastika) as before.

II. Organization and structure of unit markings.

a) Markings of Staffel aircraft:

Staffel aircraft display Latin letters A to Z, as follows:

1., 5. and 9. Staffel in white

2., 6. and 10. Staffel in black

3., 7. and 11. Staffel in clay-yellow

4., 8. and 12 Staffel in blue

(Author's note: White = RLM 21, Black = RLM 22, Clay-yellow = RLM 04, Blue = RLM 24)

b) Markings of Gruppe and Gruppenstab:

I. Gruppe of the Geschwader has no Gruppe marking,

II. Gruppe displays a horizontal bar aft of the Balkenkreuz in the appropriate Staffel colour,

III. Gruppe displays a vertical bar also in the Staffel colour.

Instead of a letter, the aircraft of the Gruppenkommandeur displays a chevron and triangle in black with white border. The Gruppe marking (I. no marking, II. horizontal bar, III vertical bar) also in black with white border.

The other aircraft of the Gruppenstab are marked similarly to the Gruppenkommandeur's aircraft, but carry only a chevron without the triangle.

c) Markings of the Geschwaderkommodore and the aircraft of the Geschaderstab:

The aircraft of the Geschwaderkommodore carries an arrow head with a horizontal bar extending back to the root of the tailfin. Colour black with white border. The other aircraft of the Geschwaderstab display only a pointed bar without the arrowhead. Colour black with white border.

d) Geschwader emblems and ground-attack triangles used hitherto are deleted.

Dimensions and method of application of the markings for Bf 109 and Fw 190 aircraft. The new markings being applied to the Fw 190, starting with the Balkenkreuz, use the same spacing and the same size as the Bf 109."

Changes to aircraft markings, 1943

"The regulation governing aircraft in Special Luftwaffe Directive 1930, p. 9 No. 7, section II (*see page 158*) is to be amended as follows:

Organization and structure of unit markings

a) Staffel aircraft (including reserve machines) display the Arabic numerals 1 to 16 as follows:

each 1. Staffel in a Gruppe in white

each 2. Staffel in a Gruppe in black

each 3. Staffel in a Gruppe in clay-yellow

each 4. Staffel in a Gruppe in blue with white border.

(Author's note: White = RML 21, Black = RLM 22, Clay-yellow = RLM 04, Blue = RLM 24)

b) Markings of Gruppe and Gruppenstab:

I. Gruppe: no Gruppe marking,

II. Gruppe: horizontal bar aft of the Balkenkreuz in the appropriate Staffel colour,

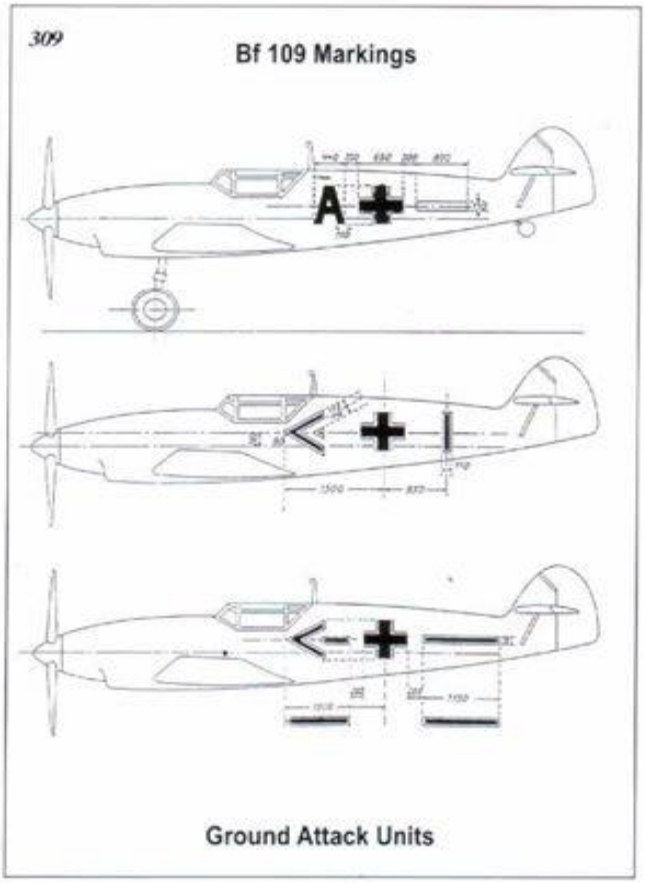
III. Gruppe: vertical bar also in the Staffel colour.

IV. Gruppe: a wavy bar in Staffel colour and border.

Instead of a number, the aircraft of the Gruppenstab leader carries a chevron and triangle in black with white border as well as the Gruppe marking (I. no marking, II. horizontal bar, III. vertical bar, IV. wavy bar) also in balck with white border. The other aircraft of the Gruppenstab are marked similarly to the Gruppenkommandeur's aircraft, but display only a chevron without the triangle.

c) Identification of the Geschwaderkommodore.

The aircraft of the Geschwaderkommodore carries an arrow head with a horizontal bar extending back to the root of the tailfin. Colour black with white border. The other aircraft of the Geschwaderstab display only a pointed bar without the arrowhead. Colour black with white border."



Marking and licensing of gliders 1943

"Under Ref. No. 38 p 38 No. 1800/43 (GQM 2 Dept./ II a)/ LB 2 II) the Reich Minister for Aviation and C-in-C of the Luftwaffe has issued the following directive:

1. Gliders (collective term) display a 4-letter marking (registration marking). Inserted between each of the two pairs of two letters is, in the case of Luftwaffe gliders a Balkenkreuz, and with civil aviation gliders a hyphen, e.g:
Luftwaffe XY + AB
Civil TZ – XR
The further marking of civil aviation gliders with the German national insignia D is to be omitted for the duration of the war when operating within the Reich or in occupied territories.

2. Luftwaffe gliders and civil aviation gliders (the latter for the duration of the war when operating within the Reich or in occupied territories) which, according to the design regulations for gliders (BVS), belong to weight class (Bgr.) 2 and ff, uniformly carry a black swastika on the rudder as the national insignia.

3. The new markings (registration markings) are issued – as with powered aircraft – by the Reich Minister for Aviation and C-in-C of the Luftwaffe, Test Centre for Aircraft / LB 2, Berlin-Adlershof; this centre also administers the master register for gliders.
"4. The Reich Minister for Aviation and C-in-C of the Luftwaffe Test Centre for Aircraft / LB 2 issues the instructions required for marking amendments and the licensing process.
No amendments of the directive on air traffic will be made until further notice.

5. The order comes into force as of 1.7.1943.
Any contrary regulations are herewith null and void."

Markings of air ambulances, 1941

The *Flugzeugmaler* 1944 (The Aircraft Painter) contains the following regarding the marking of air ambulances:

"According to L.Dv 521/1, (see Chapter 11) ambulance aircraft will be marked as follows:

1. The aircraft retain the standard camouflage allocated to the type.

2. The national marking (swastika) is placed on the rudder unit as for front line aircraft.

3. Instead of the Balkenkreuz on the wings and fuselage, the red cross will be applied on a white circle. The ratio of circle diameter (D) to the length of the bar (a) of the red cross to the width of the bar (b) is D:a:b: = 7:6:2.

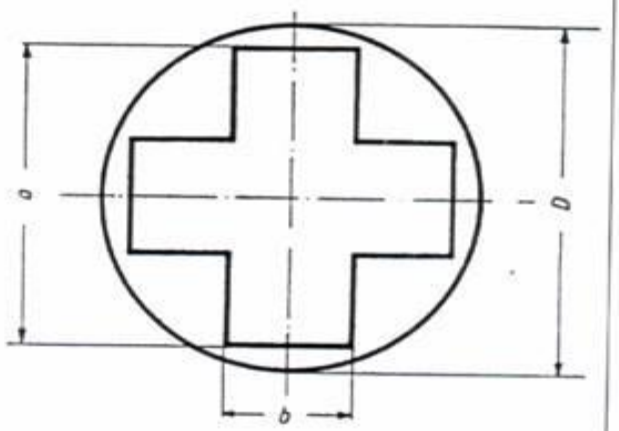


Fig. 56 Ambulance aircraft marking

The following dimensions will be used:

D = 52	70	87	105	122	140	157	175	192	210
a = 45	60	75	90	105	120	135	150	165	180
b = 15	20	25	30	35	40	45	50	55	60

All dimensions are indicated in centimetres.

The diameter of the white circle will be so selected using the above measurements that it covers the Balkenkreuz (on front line aircraft). The red cross will then be inserted.
Aviation lacquers used for
Spraying 7160.21 and 7160.23
Painting 7164.21 and 7164.23."

Ferry markings

Ferry Markings 1937

The following directive was issued by the Reich Minister and C-in-C of the Luftwaffe on 28 September 1937 and is quoted here in its entirety:

"Difficulties have arisen from the D-markings not being reported as free for further use after transfer flights, and from D-licensing documents not being amended after an aircraft has been given military markings. In addition, problems have arisen with the markings of aircraft which have had to be delivered to the manufacturer's test centre or abroad and which, as a practical measure, have received only a temporary license and not the full German markings.
The following provision is therefore to be made:
From 1.10.1937 aircraft without registration markings which are to be transferred from a manufacturer or repair-shop to a Luftwaffe station are to be given temporary German military markings for the duration of the transfer flight. Upon arrival at the aircraft's destination, these are to be removed again and replaced by the unit marking (Balkenkreuz and number).

"As well as the registration marking, the national flag insignia is to be applied on the vertical tail surfaces in accordance with the regulations issued for military aircraft.

I. Form and application of ferry markings
The ferry marking consists of four letters which are applied, as per the sketch below, to the underside of the wing, with biplanes on the underside of the lower wing. Size and spacing as per those of corresponding aircraft with civil markings (see Air Traffic Regulation of 21.8.1936, Reich Law Gazette).

In addition, the aircraft are to receive a Balkenkreuz in the prescribed size, form and colour in the locations specified for this purpose (on both fuselage sides, as well as on the upper surface and underside of the wing, with biplanes on upper surface of the top wing and underside of the lower wing). The national flag insignia must be displayed on both sides of the vertical tail surfaces. The colour of the transfer marking is black and must be removable with water; the colour of the Balkenkreuz is black, non-removable.

II. Period of validity
Ferry markings are valid only for the duration of the transfer flight. Upon arrival of the aircraft at its destination they are to be washed off immediately. Within three days of delivery the unit taking possession of the aircraft is to inform the production management of the supplying factory that the transfer markings are free for further use.

III. Air traffic regulations
Aircraft with the described transfer markings are governed by the same air traffic regulations as apply to aircraft with military markings.

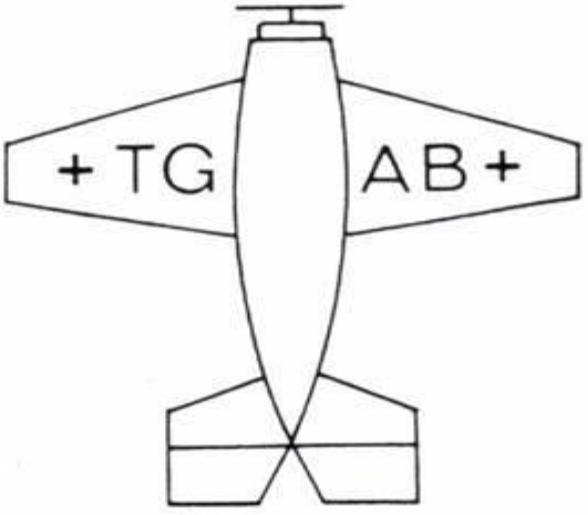
IV. Radio communication
For aircraft with ferry markings radio communication is governed by the same regulations as apply to aircraft with military markings. The call sign comprises the ferry marking prefixed by the letter D (example: transfer marking – PABA -, call sign DPABA). The call sign thus created differs from those of aircraft not operating under temporary license, and of aircraft with civil markings, in that the first letter after the "D" is not a vowel (A,E,I,O,U), but always a consonant."

Ferry Markings 1939

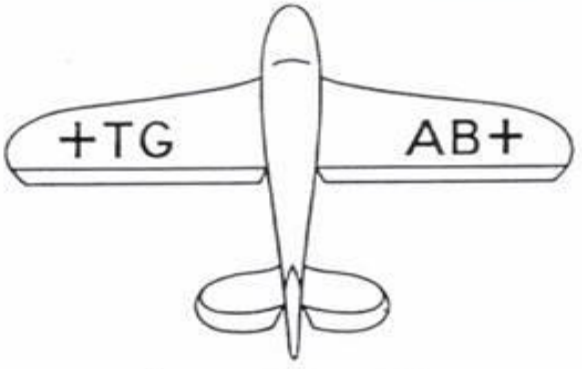
Ferry markings on Luftwaffe aircraft were introduced by Luftwaffe Regulation Notice No. 9 of 20 February 1939:

"Transit markings for military aircraft.
The following order is made, withdrawing the orders concerning transit markings for military aircraft L.C. II No. 1045/37 II8 of 23.9.1937 and ref. 38p48 L.B. II, 4 No. 4909/37 of 25.9.1937, and the order issued to certain departments only of the RLM, Ref. 38e45 L.C. 3 No. 195/39 (3V) of 16.1.1939.

I. General
Aircraft that do not yet possess a final military marking will receive a special transitional marking for the transit flight from the manufacturer's works, repairers, aviation office or air park to a Luftwaffe unit which will be removed on arrival at destination and replaced by the military marking (Balkenkreuz and number or WL and four letters). The Balkenkreuz will be applied in the prescribed size, shape and colour next to the transit marking on the underside of the wing (for multi-planes, only underneath the bottom wing). The swastika will also be applied to the rudder unit in accordance with the regulations issued for the Luftwaffe.



Ferry Markings 1937



Ferry Markings 1939

"II. Shape and application of transit markings
The transit marking consists of four letters placed on the underside of the wing according to the following sketch (for multi-planes, only on the underside of the bottom wing) and on the two sides of the fuselage. Item 4 in Annex 1 to the Aviation Regulations of 21.8.1936 (Reich Law Gazette 1936, Part I pp. 675 and 691 or R. f. L. 1936, pp. 638 and 657) applies as to size, spacing and colour of the letters. The colour of the transit markings must be washable; the Balkenkreuz will be applied with non-washable colour to aircraft with built-in weaponry and with washable colour to all other aircraft.

III. Validity
The transit marking applies only for the length of the transit flight. When the aircraft arrives at destination it must be washed off without delay. The unit accepting the aircraft will advise the works inspector at the delivery plant or the aircraft office or airpark within three days following collection that the transit marking has been removed to make way for the new one.

IV. Traffic regulations
The same traffic regulations as for aircraft with military markings apply to aircraft with the transit markings described when in transit to Luftwaffe units.

V. Radio traffic
The same provisions as for aircraft with military markings apply to radio traffic from aircraft with transit markings. The transit marking will be used as a call sign preceded by the letter D (e.g. transit marking "+TGAB+", call sign "DTGAB"). The call sign formed in this way differs from that on aircraft with civil markings in that the first letter after the "D" is not a vowel (A,E,I,O,U,Y) but always a consonant."

"VI. Issue of transit markings
Transit markings are assigned by RLM – L.B. II 8 to the factory inspectors, aircraft offices and airparks. These units will keep records of the issue of markings so that it will be evident at all times which aircraft was issued a particular marking on a particular day and who undertook the transit. Manufacturers may still apply for civil markings (countersigned by the works inspectorate) only if it is clear that the aircraft will actually retain this marking and will not subsequently have a military marking applied. Transit markings hitherto assigned by the building inspectorates will be retained. The transit markings for aircraft offices and airparks will be allocated by special order."

310 Below left: *Diagrams showing transit markings in 1937 and 1939*

311 Right: *A Ju 52 marked as a medical aircraft. The markings were painted in accordance with the regulations detailed on page 169. Again this aircraft appears to have had a single overall finish of 71 and 65. The swastika is from the 'mid-period' without a black border.*

312: *A brand new Fw 58G-1, TR+AU, in splinter 70/71 camouflage, fully marked as an ambulance aircraft in accordance with the regulations. Note how bright the undersides appear*

The transit markings described above remained the standard during the war until *Sammelmitteilung* 1 of July 1944 made the following change:

> "**Abandonment of transit markings**
> The markings used hitherto consisting of black or white markings in washable colour on the fuselage will cease to apply with immediate effect. Instead, the works number without a suffix, i.e. the number on its own, will be applied to the rudder unit, in shade 22 or 21, aviation lacquer 7160 or 7164 **or** 7165. The height of the figures is 25 cm, possibly smaller e.g. if the Balkenkreuz would be encroached upon."

The above order from the *Sammelmitteilung* is therefore the reason for the emergence of the large serial numbers on the rudder unit of aircraft produced in the last months of the war.

Propeller spinner spiral markings

Allied intelligence used 'Ultra' to decrypt a Luftwaffe signal dated 10 February 1944 which stated:

> "Additional orders of 10th for units operating in defence of the Reich:
> a. Band around fuselage to remain as marking for individual Geschwader
> b. In principle, all Kommodores and Kommandeurs to fly with white fins and rudder.
> c. All fighter aircraft of Luftflotte 3 and Luftflotte Reich to have black and white spiral painted on spinner. One and a half spirals turning same direction as spinner, width one fifth of diameter of spinner."

An order from Stab to II./JG 11 on 25 June 1944:

> "With immediate effect, aircraft to be marked only with spiral on propeller spinner, cross, tactical number and Gruppe mark (bars)."

On 29 June 1944:

> "Now known that aircraft marking instructions apply to all Luftflotte 3 aircraft. Spiral on spinner to be black and white. Additional markings to be retained exclusively for fighters, ground attack and reconnaissance aircraft."

7 Jagd Division noted on 14 July 1944, referring to Luftflotte Reich orders of 5 July:

> "All fighter aircraft going to the West on operations to be provided only with black and white spirals on spinner. All other special identification markings to be discontinued."

Recognition bands for Reich Air Defence

For Reich Air Defence, recognition bands were introduced in the final stages of the war, formalised in an order dated 20 February 1945:

> "**Subject: Jagdgeschwader markings**
> By order of the Reichsmarschall and for the purpose of improving aerial recognition, Jagdgeschwader aircraft are to be marked by fuselage-encircling coloured stripes as shown in the appended enclosure. The attention of troops down to platoon level is to be drawn to these markings which should simplify the recognition and distinction of our own aircraft.
> IA
> (signature illegible)
> Leutnant u. Ord.-Offz."

The attachment sheet contained diagrams of the colours as they were intended to be applied on the aircraft. For one colour a width of 900mm was specified; for two 450mm each and for three 300mm each. By these means Luftwaffe fighter units could be more easily recognised in the air. The following colour combinations, shown in the sequence they appeared in the original orders, are known for the individual squadrons. In each case the colour towards the front of the aircraft is noted first:

JG 1	Bright Red
JG 3	White
JG 11	Yellow
JG 27	Bright Green
JG 53	Black
JG 54	Bright Blue
JG 5	Black/Yellow
JG 7	Blue/Red
JG 26	Black/White
JG 52	Red/White
JG 77	White/Green
JG 301	Yellow/Red
JG 2	Yellow/White/Yellow
JG 4	Black/White/Black
JG 6	Bright Red/White/Bright Red
JG 51	Bright Green/White/Bright Green
JG 300	Bright Blue/White/Bright Blue

The latest research has revealed that other forms of Reich defence bands also existed. These were chequered and followed logically from the fact that there were more squadrons than variants listed in the above table. This method of banding was allocated to industrial protection units. Another possibility which the author believes to be correct is that the chequered bands were allocated to new fighter squadrons. In both cases no definitive explanation is possible without appropriate documents. Tentative identifications of the chequered bands are:

III./KG(J) 54	Green/white (J=Jagd=Fighter)
KG(J) 6	Red/black
KG(J) 54	Blue/white
3./ISS 1	Blue/green (ISS= Industry Protection Flight)

In the end, fighter squadrons were made up from practically anything that could fly, which also explains why the number and style of fuselage bands as previously used no longer proved adequate.